

# Utah Water Supply Outlook Report

May, 2005



Mt Timpanogos with wet, point release avalanches. Photo by Randy Julander, NRCS, USDA - April 27, 2005.

# Water Supply Outlook Reports and Federal - State - Private Cooperative Snow Surveys

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#### How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snowcourses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. These forecasts are coordinated between hydrologists in the Natural Resources Conservation Service and the National Weather Service. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

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#### STATE OF UTAH GENERAL OUTLOOK May 1, 2005

#### **SUMMARY**

April of 2005 saw some interesting climate in various places in Utah, but for the most part, it was near average. In the north, an area which has some of the lowest snowpack, intense precipitation caused some high flows in both Cache and Box Elder counties. Precipitation events of this kind pose an elevated risk statewide over the next 30 to potentially 60 days as snowmelt brings streams to higher levels and soil moisture to near saturated conditions. Fortunately, current conditions are substantially lower than conditions found in May of 1983, the generally recognized flood year. Most low elevation snowpacks are melted out as well as a portion of the mid elevation. In 1983, both of these areas were still accumulating snowpack during the early part of May and this could well take the edge off of potentially high flows yet to come this year. Higher elevation snowpack continue to accumulate snow. Overall, water supply conditions are improving statewide. Snowpacks range from 102% over the Bear River Watershed to 294% over southwest Utah. None of the basin snowpack averages are now in record territory but many individual sites have shattered all time record maximum snowpack totals. Low elevation snowpacks are much less than we have seen in other large years due mainly to relatively mild temperatures this winter. With large snowpacks in southern Utah and the Uintah basin, comes the potential for very high snowmelt streamflow. For some streams like Coal Creek which has over 69 inches of water yet to melt and has broken the old maximum record snowpack by nearly 15 inches of snow water equivalent, it is likely not if, but merely when the high flows will occur. While many outcomes remain possible in these areas, it is prudent to begin preparation for potentially high snowmelt streamflow this spring, likely within the next 4 weeks. Precipitation for April was exactly average statewide at 100%. Northern Utah ranged from 78% to 113% and southern Utah had 78% to 132% of average. This brings the seasonal precipitation, (Oct-Apr) to 133%. Estimates of soil moisture range from about 47% to 94% of saturation in the upper 24 inches of soil. Low reservoir storage is becoming less of a concern with total reservoir storage at 53% of capacity, up 4% from last year. All reservoirs statewide should fill except Bear Lake, Utah Lake, Strawberry and Scofield Reservoir. The area of greatest drought concern is the Bear River with current reservoir storage at only 13% of capacity. Areas that could have high streamflows include the Uintah Basin, southeast Utah, Escalante, upper Sevier and the Virgin. Streamflow forecasts range from 58% to 351% of average. Surface Water Supply Indices range from 4% on the Bear River, to 95% on the Virgin.

#### **SNOWPACK**

May first snowpacks as measured by the NRCS SNOTEL system range from 102% on the Bear to 294% in southwestern Utah. Most snowpacks in northern Utah are 236% to 280% higher than last year, whereas the Uintah Basin and everything south of Salina have 270% to 429% of the snowpacks of last year. The Midway Valley SNOTEL site currently has 69.1 inches of snow water equivalent and its May 1 average is only 23.2 inches. Of some concern are low elevation snowpacks across the state, which are below average. Overall, snowpacks are much improved from years past.

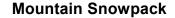
#### **PRECIPITATION**

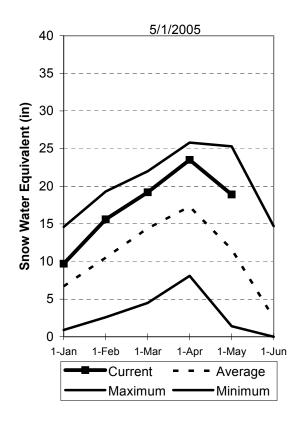
Mountain precipitation during April was 100% of average statewide. Precipitation was lower on the North Slope and the South East (78%) and a little higher over the South West at 132% of normal. This brings the seasonal accumulation (Oct-Apr) to 133% of average statewide.

#### RESERVOIRS

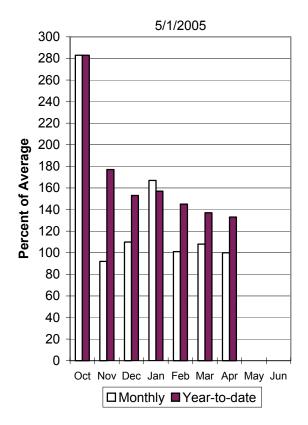
Storage in 41 of Utah's key irrigation reservoirs is at 53% of capacity. This is an increase of 4% from last year. Reservoirs across the State have been making steady gains in storage. Larger reservoirs such as Bear Lake and Utah Lake remain low. Most reservoirs should fill this year.

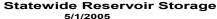
Snowmelt streamflows are expected to be below average to much above average and even into record flows across the state of Utah this year. Forecast streamflows range from 58% on the Bear at Stewart dam to 352% on the Virgin. Most flows are forecast to be in the 100% to 160% range. Overall water supply conditions are improving.

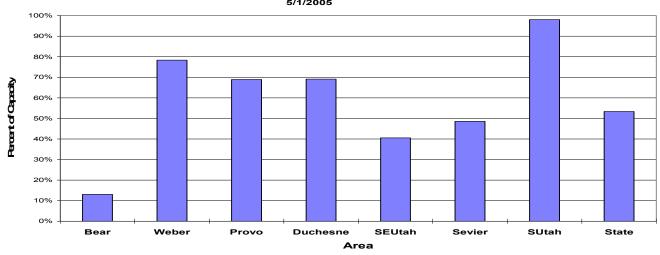




#### **Precipitation**



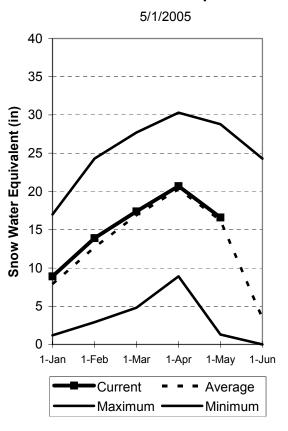




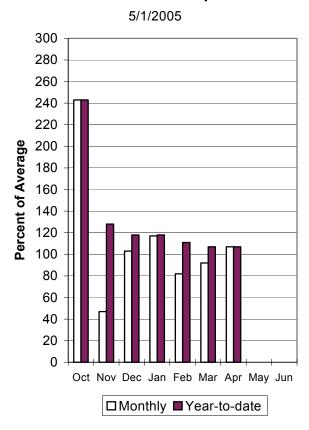
#### Bear River Basin May 1, 2005

Snowpacks on the Bear River Basin are near average at 102% of normal, about 243% of last year and the same as last month at 102% percent. Specific sites range from 0% to 132% of normal. April precipitation was near average at 107%, which brings the seasonal accumulation (Oct-Apr) to 107% of average. Soil moisture levels in runoff producing areas are at 79% of saturation in the upper 2 feet of soil compared to 70% last year and up 8% from last month. Forecast streamflows range from much below to near average (58%-122%) volumes this spring. Reservoir storage is extremely low at 13% of capacity, 1% more than last year. The Surface Water Supply Index is at 4% for the Bear River, or 96% of years have had more total water available. Water supply conditions are much below normal due to low reservoir storage.

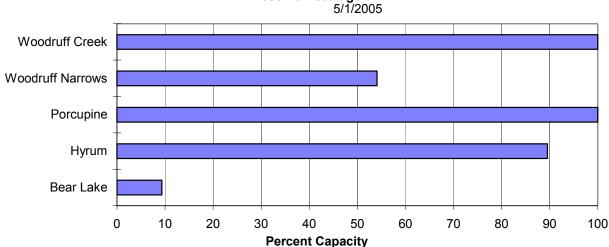
#### **Bear River Snowpack**



#### **Bear River Precipitation**



#### Reservoir Storage



#### BEAR RIVER BASIN

#### Streamflow Forecasts - May 1, 2005

	1	<b>&lt;&lt;====</b>	Drier ====	== Future Co	onditions ==	===== Wetter	====>>	
Forecast Point	Forecast Period	======   90%   (1000AF)	70% (1000AF)	= Chance Of E   50   (1000AF)	-	30% (1000AF)	10%   (1000AF)	30-Yr Avg. (1000AF)
Bear River nr UT-WY State Line	APR-JUL	109	117	========   123	109	<del>======</del>   129	137	113
Bear River ab Reservoir nr Woodruff	APR-JUL	116	134	   147	108	   160	178	136
Big Creek nr Randolph	APR-JUL	4.2	4.7	I   5.0	102	I   5.3	5.8	4.9
Smiths Fork nr Border	APR-JUL	83	88	   91	88	1   94 	99	103
Bear River at Stewart Dam	APR-JUL	95	119	1   136 	58	1   155 	184	234
Little Bear River at Paradise	APR-JUL	45	51	,   56 	122	,   61 	69	46
Logan River nr Logan combined flow	APR-JUL	120	129	135 	107	141 	151	126
Blacksmith Fork nr Hyrum	APR-JUL	47	53	58 	121	63 	70	48
	=======							

BEAR RIVER BASIN Reservoir Storage (1000 AF) - End of April

BEAR RIVER BASIN Watershed Snowpack Analysis - May 1, 2005

Reservoir	Usable   Capacity	*** Usa This Year	ble Storag Last Year	e ***       Avg	Watershed D	Number of ata Sites	This Year	
								-
BEAR LAKE	1302.0	121.7	101.4	!	BEAR RIVER, UPPER (abv H	a 6	249	106
HYRUM	15.3	13.7	15.3	13.2	BEAR RIVER, LOWER (blw H	a 8	262	98
PORCUPINE	11.3	11.3	11.3	9.5	LOGAN RIVER	4	244	117
WOODRUFF NARROWS	57.3	31.0	28.0	38.5	RAFT RIVER	1	120	99
WOODRUFF CREEK	4.0	4.0	4.0	¦	BEAR RIVER BASIN	14	256	102

<sup>\* 90%, 70%, 50%, 30%,</sup> and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

<sup>(1) -</sup> The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.(2) - The value is natural volume - actual volume may be affected by upstream water management.

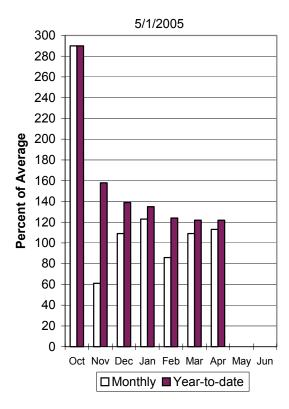
#### Weber and Ogden River Basins May 1, 2005

Snowpack on the Weber and Ogden Watersheds is above normal at 129%, about 236% of last year and up 9% from last month. Individual sites range from 0% to 196% of average. April precipitation was slightly above average at 113% bringing the seasonal accumulation (Oct-Apr) to 122% of average. Soil moisture levels in runoff producing areas are at 78% of saturation in the upper 2 feet of soil compared to 77% last year and up 6% from last month. Streamflow forecasts range from 102% to 162% of average. Reservoir storage is at 78% of capacity, about 15% more than last year. The Surface Water Supply Index is at 77% for the Weber River and at 61% for the Ogden River. Overall water supply conditions are near to above normal and improving.

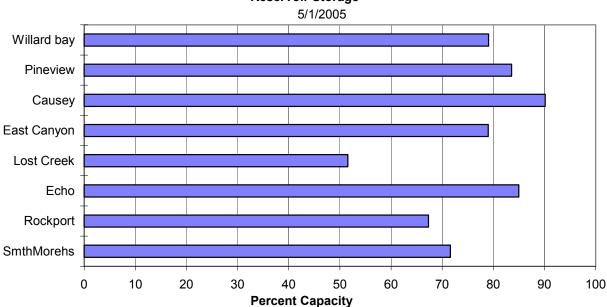
#### Weber River Snowpack

### 5/1/2005 40 35 Snow Water Equivalent (in) 30 25 20 10 5 1-Feb 1-Mar 1-May 1-Apr Current Average Minimum Maximum

#### **Weber River Precipitation**



#### **Reservoir Storage**



#### WEBER & OGDEN WATERSHEDS in Utah Streamflow Forecasts - May 1, 2005

	 					====== Wetter	i	
Forecast Point	Forecast   Period   	90% (1000AF)	70%   (1000AF)	50	-	30%   (1000AF)	10%   1000AF)	30-Yr Avg. (1000AF)
Smith & Morehouse Res inflow	APR-JUL	36	38	40	118		44	34
Weber River nr Oakley	APR-JUL	135	144	150	122	   156	165	123
Rockport Reservoir inflow	APR-JUL	147	158	166	124	   174	185	134
Weber River nr Coalville	APR-JUL	153	164	171	125	   178	189	137
Chalk Creek at Coalville	APR-JUL	38	45 I	50	111	l   55	62	45
Echo Reservoir inflow	APR-JUL	181	198	210	117	   220	240	179
Lost Creek Reservoir inflow	APR-JUL	14.1	16.4	18.0	102	   19.7	22	17.6
East Canyon Reservoir inflow	APR-JUL	37	41	44	142	   47	52	31
Weber River at Gateway	APR-JUL	415	450 I	475	134	l I 500	535	355
SF Ogden River nr Huntsville	APR-JUL	65	69 I	72	113	l I 75	79	64
Pineview Reservoir inflow	APR-JUL	125	135 I	145	109	   155	165	133
Wheeler Creek nr Huntsville	APR-JUL	9.2	9.8	10.2	162	   10.6 	11.2	6.3
WEBER & OGDEN Reservoir Storage (1	   		OGDEN WATERSH nowpack Analys					
Reservoir	Usable		.e Storage **	:======= :*     Water	ahad	Numbe		Year as % of

Re	servoir Storage (1000				Watershed Snowpack Analysis - May 1, 2005					
Reservoir		Usable   Capacity  	*** Usab This Year	Le Storage Last Year	***   Avg	Watershed	Number of Data Sites	This Year		
CAUSEY		7.1	6.4	6.8	4.0	OGDEN RIVER	4	219	121	
EAST CANYON		49.5	39.1	36.5	40.5	WEBER RIVER	9	228	133	
ЕСНО		73.9	62.8	55.9	52.9	WEBER & OGDEN WATERSHE	DS 13	225	129	
LOST CREEK		22.5	11.6	5.6	15.6					
PINEVIEW		110.1	92.0	91.2	77.7					
ROCKPORT		60.9	41.0	42.4	38.6					
WILLARD BAY		215.0	170.0	102.7	168.0					

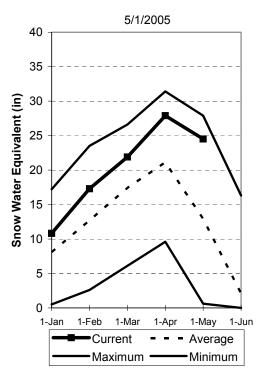
<sup>\* 90%, 70%, 50%, 30%,</sup> and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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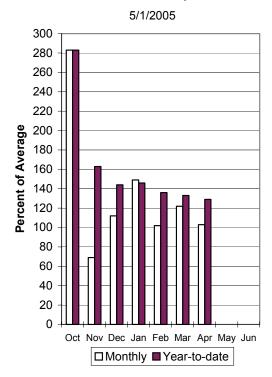
#### Utah Lake, Jordan River & Tooele Valley Basins May 1, 2005

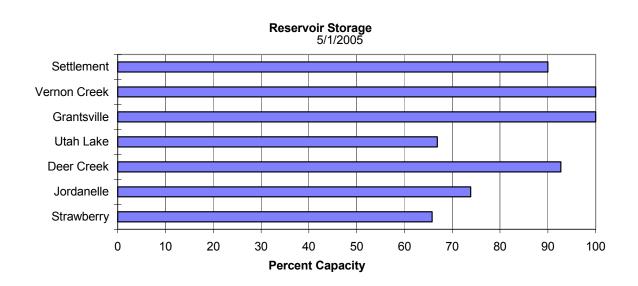
Snowpacks over these watersheds are above average at 147%, 280% of last year and up 14% from last month. Individual sites range from 9% to 214% of average. April precipitation was near average at 103%, bringing the seasonal accumulation (Oct-Apr) to 129% of average. Soil moisture levels in runoff producing areas are at 78% of saturation in the upper 2 feet of soil compared to 80% last year and up 10% from last month. Forecast streamflows range from 110% to 184% of average. Reservoir storage is at 69% of capacity, 1% more than last year. The Surface Water Supply Index is at 44%, or 56% of years would have more total water available. General water supply conditions are near normal and improving.

#### **Provo River Snowpack**



#### **Provo River Precipitation**





#### UTAH LAKE, JORDAN RIVER & TOOELE VALLEY Streamflow Forecasts - May 1, 2005

		<<===== 	Drier ====	== Future (	Conditions ==	===== Wetter	: ====>>	
Forecast Point	Forecast Period	=======   90%   (1000AF)	70% (1000AF)	1 5	Exceeding * : 50% (% AVG.)	30%   (1000AF)	10%   (1000AF)	30-Yr Avg. (1000AF)
Spanish Fork River nr Castilla	APR-JUL	62	81	100	130	119	138	77
Provo River nr Woodland	APR-JUL	115	126	1   135	131	   144	155	103
Provo River nr Hailstone	APR-JUL	125	144	I   155	142	   166	185	109
Provo R blw Deer Creek Dam	APR-JUL	144	163	   180	143	   197	215	126
American Fk R nr American Fk	APR-JUL	53	57	i   59	184	   61	65	32
Utah Lake inflow	APR-JUL	330	397	   450	139	1   503	570	325
Little Cottonwood Ck nr SLC	APR-JUL	49	53	I   55	138	I   58	61	40
Big Cottonwood Ck nr SLC	APR-JUL	46	50	i   53	140	1   56	60	38
Mill Creek nr SLC	APR-JUL	6.5	7.5	I   8.5	121	I   9.5	10.5	7.0
Parley's Creek nr SLC	APR-JUL	16.5	19.3	l   22	132	l   25	27	16.7
Dell Fork nr SLC	APR-JUL	6.1	7.8	I I 9.0	132	10.3	11.9	6.8
Emigration Creek nr SLC	APR-JUL	3.6	5.0	I I 6.0	133	1   7.0	8.5	4.5
City Creek nr SLC	APR-JUL	8.9	10.6	   11.8	136	   13.1	14.7	8.7
Vernon Creek nr Vernon	APR-JUL	1.6	2.0	l   2.3	155	l   2.7	3.3	1.5
Settlement Creek nr Tooele	APR-JUL	2.3	2.5	   2.6	132	l   2.8	3.0	2.0
South Willow Creek nr Grantsville	APR-JUL	4.3	4.7	I   5.0 	155	I   5.3 	5.7	3.2
UTAH LAKE, JORDAN Reservoir Storage (100				   		JORDAN RIVER nowpack Analys		
Reservoir	Usable	*** Usabl This	======= e Storage * Last	•	ershed	Numbe of		Year as % of
keservoir	Capacity    	Year	Year A	Wate vg   ==== ======		OI Data Si	tes Last	Yr Average

	Usable		ble Stora	ge ***		Number	This Year	r as % of
Reservoir	Capacity	This Year	Last Year	Avg	Watershed	of Data Sites	Last Yr	Average
	' =========		=======	 =======				
DEER CREEK	149.7	138.8	70.6	119.4 j	PROVO RIVER & UTAH LAKE	7	613	136
GRANTSVILLE	3.3	3.3	2.5	2.8	PROVO RIVER	4	577	145
SETTLEMENT CREEK	1.0	0.9	0.8	0.7	JORDAN RIVER & GREAT SA	LT 6	230	154
STRAWBERRY-ENLARGED	1105.9	727.4	787.7	663.7	TOOELE VALLEY WATERSHED	3	254	152
UTAH LAKE	870.9	582.4	545.8	872.6	UTAH LAKE, JORDAN RIVER	& 16	301	147
VERNON CREEK	0.6	0.6	0.7					
				I				

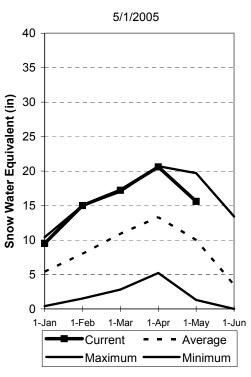
<sup>\* 90%, 70%, 50%, 30%,</sup> and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

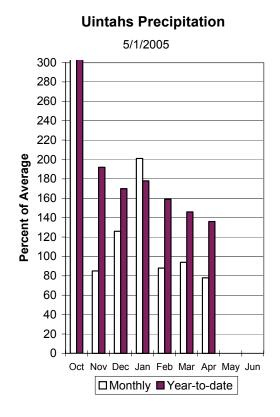
<sup>(1) -</sup> The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.(2) - The value is natural volume - actual volume may be affected by upstream water management.

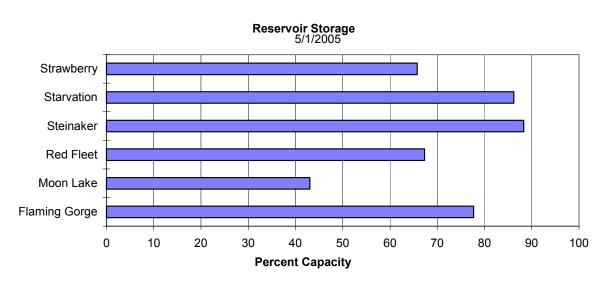
## **Uintah Basin and Dagget SCD's May 1, 2005**

Snowpacks across the Uintah Basin and North Slope areas are much above average at 144%, which is 278% of last year and down 10% from last month. April had 200% of normal snowmelt. The North Slope ranges from 41% to 187% and the Uintah Basin ranges from 0% to 311% of average. Precipitation during April was below average at 78% bringing the seasonal accumulation (Oct-Apr) to 136% of average. Soil moisture values in runoff producing areas are at 74% of saturation in the upper 2 feet of soil compared to 65% last year, and up 10% from last month. Reservoir storage is at 69% of capacity, 4% less than last year. The Surface Water Supply Index for the western area is 74% and for the eastern area it is 85% indicating above normal conditions basin wide. Streamflow forecasts range between 124% and 209% of average. Springtime runoff conditions are above normal. Several weeks of snow accumulation in the high country is yet possible. Preparation for high flows should be considered.

#### **Uintahs Snowpack**







#### UINTAH BASIN & DAGGET SCD'S Streamflow Forecasts - May 1, 2005

	=======	   <<	Drier ====	== Future Co	onditions ==	===== Wetter	:=====>>	
Forecast Point	Forecast Period	=======   90%   (1000AF)	70% (1000AF)	1 50	)% (% AVG.)	30%   (1000AF)	10%   (1000AF)	30-Yr Avg. (1000AF)
Blacks Fork nr Robertson	APR-JUL	78	90	   99	104	   108	123	95
EF of Smiths Fork nr Robertson	APR-JUL	20	25	   29	94	   33	39	31
Flaming Gorge Reservoir Inflow	APR-JUL	750	930	   1070	90	   1230	1460	1190
BIG BRUSH CK abv Red Fleet Resv	APR-JUL	25	29	l   33	157	l   37	43	21
Ashley Creek nr Vernal	APR-JUL	76	86	   94	181	   102	114	52
WF DUCHESNE RIVER nr Hanna	APR-JUL	21	26	I I 30	125	   34	41	24
DUCHESNE R nr Tabiona	APR-JUL	93	114	   130	124	   146	172	105
UPPER STILLWATER RESV inflow	APR-JUL	112	123	   130	159	   138	149	82
ROCK CK nr Mountain Home	APR-JUL	118	131	   139	156	   148	161	89
DUCHESNE R abv Knight Diversion	APR-JUL	235	260	l   275	146	   290	320	188
STRAWBERRY RES nr Soldier Springs	APR-JUL	57	73	l   85	144	l   99	120	59
CURRANT CREEK RESV Inflow	APR-JUL	17.8	24	l   28	112	   33	41	25
STARVATION RESERVOIR inflow	APR-JUL	108	134	   155	128	   178	215	121
Lake Fork River abv Moon Lake	APR-JUL	87	98	   105	154	   113	124	68
Yellowstone River nr Altonah	APR-JUL	85	95	   102	165	1   109	119	62
DUCHESNE R at Myton	APR-JUL	365	435	l   485	187	   540	620	260
Whiterocks River nr Whiterocks	APR-JUL	90	102	   110	196	   119	132	56
DUCHESNE R nr Randlett	APR-JUL	540	620	I   680 	209	I   740 	840	325

Reservoir Storage (10	UINTAH BASIN & DAGGET SCD'S Reservoir Storage (1000 AF) - End of April						UINTAH BASIN & DAGGET SCD'S   Watershed Snowpack Analysis - May 1, 2005					
Reservoir	Usable   Capacity	*** Us This Year	able Stora Last Year	age ***       Avg	Watershed Da	Number of ta Sites	This Yea	r as % of  Average				
FLAMING GORGE	3749.0	2913.0	2638.0	2952.0	UPPER GREEN RIVER in UTAH		291	99				
MOON LAKE	49.5	21.3	17.8	30.8	ASHLEY CREEK	2	2062	174				
RED FLEET	25.7	17.3	13.4	19.9	BLACK'S FORK RIVER	2	132	78				
STEINAKER	33.4	29.5	17.5	25.0	SHEEP CREEK	1	700	49				
STARVATION	165.3	142.5	157.6	139.7	DUCHESNE RIVER	11	275	163				
STRAWBERRY-ENLARGED	1105.9	727.4	787.7	663.7	LAKE FORK-YELLOWSTONE CRE	4	186	154				
				ļ	STRAWBERRY RIVER	4	0	132				
					UINTAH-WHITEROCKS RIVERS	2	311	212				
				 	UINTAH BASIN & DAGGET SCD	17	278	144				

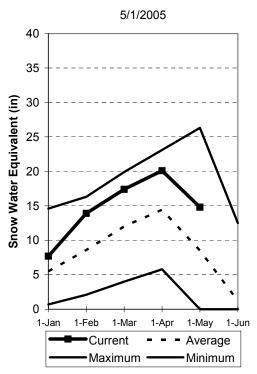
<sup>\* 90%, 70%, 50%, 30%,</sup> and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

 <sup>(1) -</sup> The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
 (2) - The value is natural volume - actual volume may be affected by upstream water management.

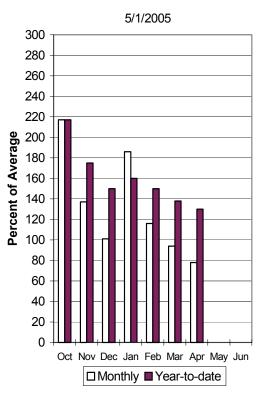
#### Carbon, Emery, Wayne, Grand and San Juan Co. May 1, 2005

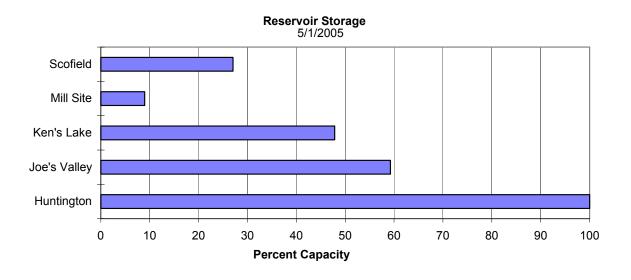
Snowpacks in this region are much above normal at 146% of average, about 384% of last year and up 7% from last month. Individual sites range from 0% to 400% of average. Precipitation during April was below average at 78%, bringing the seasonal accumulation (Oct-Apr) to 130% of normal. Soil moisture estimates in runoff producing areas are at 78% of saturation in the upper 2 feet of soil compared to 74% last year and up 8% from last month. Forecast streamflows range from 68% to 343% of average. Reservoir storage is at 41% of capacity, down 7% from last year. Surface Water Supply Indices for the area are: Price 29%, (below normal) San Rafael area 56% (near average) and Moab 58% (near average). General runoff and water supply conditions are below normal on the Price and much above normal in the southeast.

#### **Southeast Utah Snowpack**



#### **Southeast Utah Precipitation**





### CARBON, EMERY, WAYNE, GRAND, & SAN JUAN Co. Streamflow Forecasts - May 1, 2005

		   <<	 Drier ==		Future Co	onditions ==	===== Wetter	=====>>   >	
Forecast Point	Forecast			=== Ch				 	
	Period	90% (1000AF)	70% (1000AF)	ļ !	50 (1000AF)	)%   (% AVG.)	30% (1000AF)	10%   (1000AF)	30-Yr Avg. (1000AF)
Gooseberry Creek nr Scofield	APR-JUL	9.8	11.7	:== ===   !	13.0	109	14.5	16.8	11.9
Scofield Reservoir inflow	APR-JUL	41	45	-	48	104	51	55	46
White River blw Tabbyune Creek	APR-JUL	15.3	17.9	!	20	115	22	26	17.4
Green River at Green River, UT	APR-JUL	2410	2880	ļ !	3120	98	3580	4150	3170
Electric Lake inflow	APR-JUL	11.9	13.7	ļ !	15.0	96	16.3	18.5	15.7
HUNTINGTON CK nr Huntington	APR-JUL	38	43	ļ	46	92	49	54	50
JOE'S VALLEY RESV Inflow	APR-JUL	46	54	!	60	103	66	76	58
Ferron Creek nr Ferron	APR-JUL	33	38	!	41	105	44	50	39
Colorado River nr Cisco	APR-JUL	3520	4100	ļ	4500	97	4900	5480	4650
Mill Creek at Sheley Tunnel nr Moab	APR-JUL	5.1	6.2	ļ	7.0	140	7.8	8.9	5.0
Seven Mile Creek nr Fish Lake	APR-JUL	5.4	6.3	!	7.0	100	7.7	8.9	7.0
Muddy Creek nr Emery	APR-JUL	15.9	18.9	ļ !	21	106	23	27	19.9
North Ck ab R.S. nr Monticello	MAR-JUL	2.0	2.7	ļ !	3.3	340	3.9	4.9	1.0
South Ck ab Lloyd's Res nr Monticell	MAR-JUL	3.1	3.9	ļ	4.5	329	5.2	6.4	1.4
Recapture Ck bl Johnson Ck nr Blandi	MAR-JUL	10.3	13.6	ļ ļ	16.3	323	19.4	25	5.0
San Juan River nr Bluff	APR-JUL	1720	1970	-	2100	171	2210	2460	1230
CARBON, EMERY, WAYNE, Reservoir Storage (1000	AF) - End	of April			İ	Watershed Sr	, WAYNE, GRAND	s - May 1,	2005
Reservoir	Usable	*** Usabl	e Storage		     Wate:		Number of		Year as % of
Reservoir	Capacity  	This Year	Last Year	Avg	water	rsnea	Data Sit		Yr Average
HUNTINGTON NORTH	4.2	4.2	4.1	4.1	PRICE	E RIVER	3	696	127
JOE'S VALLEY	61.6	36.5	38.8	41.9	SAN F	RAFAEL RIVER	3	201	105
KEN'S LAKE	2.3	1.1	0.9	1.6	MUDDY	CREEK	1	393	121
MILL SITE	16.7	1.5	8.0	99.7	FREMO	ONT RIVER	3	289	205
SCOFIELD	65.8	17.8	20.7	37.4	   LASAI	L MOUNTAINS	1	1967	136
					   BLUE	MOUNTAINS	1	3200	400

WILLOW CREEK

CARBON, EMERY, WAYNE, GRA 13

522

384

157

146

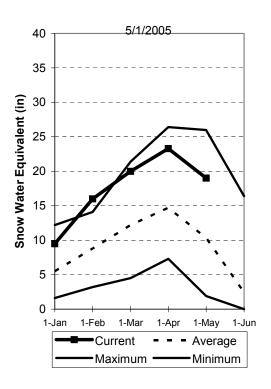
<sup>\* 90%, 70%, 50%, 30%,</sup> and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table. The average is computed for the 1971-2000 base period.

The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
 The value is natural volume - actual volume may be affected by upstream water management.

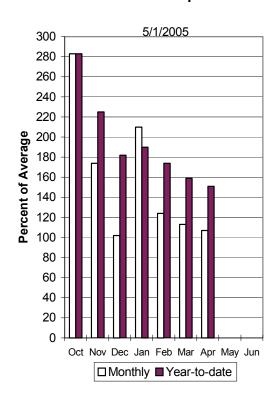
#### Sevier and Beaver River Basins May 1, 2005

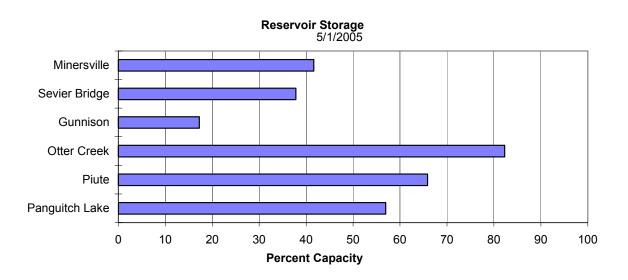
Snowpacks on the Sevier River Basin are much above normal at 173% of average, about 270% of last year and up 15% from last month. The lower Sevier area is below average at 89%. Individual sites range from 0% to 711% of average. Precipitation during April was near average at 107% of normal, bringing the seasonal accumulation (Oct-Apr) to 151% of average. Soil moisture estimates in runoff producing areas are at 78% of saturation (Sevier) in the upper 2 feet of soil compared to 61% last year an up 4% from last month. Streamflow forecasts range from 111% to 300% of average. Reservoir storage is at 49% of capacity, 18% more than last year. Surface Water Supply Indices are: Upper Sevier 94%, Lower Sevier 91% and Beaver 87%. Water supply conditions are much above average due to high snowpack and soil moisture. There could still be a several weeks of snow accumulation in the high country. On the upper Sevier, preparation for high flows is appropriate.

#### **Sevier River Snowpack**



#### **Sevier River Precipitation**





#### SEVIER & BEAVER RIVER BASINS

| <<===== Drier ===== Future Conditions ====== Wetter ====>> |

Streamflow Forecasts - May 1, 2005

Forecast Point	Forecast	=======							
	Period	90% (1000AF)	70% (1000AF)	 	50 (1000AF)	)%   (% AVG.)	30% (1000AF)	10%   (1000AF)	30-Yr Avg. (1000AF)
Sevier River at Hatch	APR-JUL	149	159	 !	165	300 [	171	181	55
Sevier River nr Kingston	APR-JUL	189	210	-	220	247	230	250	89
EF Sevier R nr Kingston	APR-JUL	68	80	į	87	229	94	106	38
Sevier R blw Piute Dam	APR-JUL	245	280	į	300	238	320	355	126
Clear Creek nr Sevier	APR-JUL	37	44	į	46	209	49	55	22
Salina Creek at Salina	APR-JUL	16.1	26		32	162	38	48	19.7
Manti Creek nr Manti	APR-JUL	15.0	17.9		20	110	22	26	18.1
Sevier R nr Gunnison	APR-JUL	330	460	į	545	195	630	760	280
Chicken Creek nr Levan	APR-JUL	4.7	5.5		6.1	136	6.7	7.8	4.5
Oak Creek nr Oak City	APR-JUL	2.0	2.4	-	2.6	157	2.9	3.3	1.7
Beaver River nr Beaver	APR-JUL	43	48	į	52	193	56	63	27
Minersville Reservoir inflow	APR-JUL	26	34	i	41	247	48	60	16.6
				l 		 			
SEVIER & BEAV Reservoir Storage (100				1	l I		& BEAVER RIV owpack Analys		2005
Reservoir	Usable   Capacity	*** Usabl This	======== Last	***	     Water	ahod	Numbe of		Year as % of
Reservoir	Capacity	Year		Avg	water	snea	Data Si		
GUNNISON	20.3	3.5	3.3	15.7	UPPER	R SEVIER RIVE	R (south 8	387	271
MINERSVILLE (RkyFd)	23.3	9.7	7.1	18.0	EAST	FORK SEVIER	RIVER 3	345	263
OTTER CREEK	52.5	43.2	29.6	46.0	SOUTH	I FORK SEVIER	RIVER 5	419	275
PIUTE	71.8	47.3	12.6	55.5	   LOWER	R SEVIER RIVE	R (inclu 6	161	89
SEVIER BRIDGE	236.0	89.2	72.9 1	.83.6	   BEAVE	R RIVER	2	240	181
PANGUITCH LAKE	22.3	12.7	7.3 1	.64.6	SEVIE	R & BEAVER R	IVER BAS 16	275	173

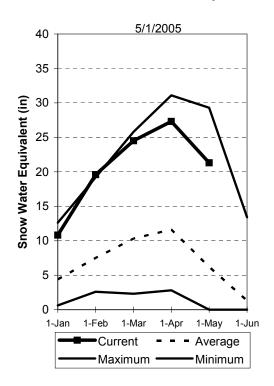
<sup>\* 90%, 70%, 50%, 30%,</sup> and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

<sup>(1) -</sup> The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.(2) - The value is natural volume - actual volume may be affected by upstream water management.

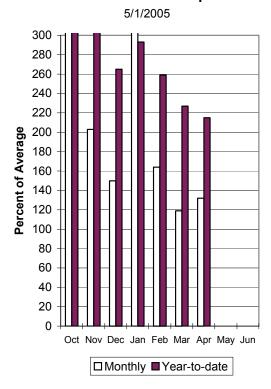
#### E. Garfield, Kane, Washington, & Iron co. May 1, 2005

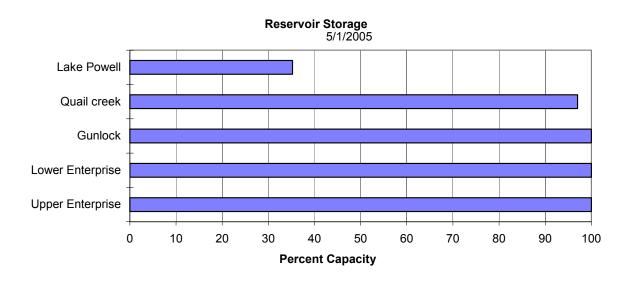
Snowpacks in this region are much above normal at 294% of average, about 429% of last year and up 60% from last month. Individual sites range from 0% to 467% of average. Precipitation was above normal during April at 132% of average, bringing the seasonal accumulation (Oct-Apr) to 215% of normal. Soil moisture estimates in runoff producing areas are at 69% of saturation in the upper 2 feet of soil compared to 61% last year and down 3% from last month. Forecast streamflows range from 346% to 352% of average. Reservoir storage is at 98% of capacity, 39% more than last year. The Surface Water Supply Index is at 95%, indicating much above normal water availability. April has heightened concerns over the potential for high flows this spring, some of which have already occurred. More snow accumulation in the high country is yet possible.

#### **Southwest Utah Snowpack**



#### **Southwest Utah Precipitation**





#### E. GARFIELD, KANE, WASHINGTON, & IRON Co. Streamflow Forecasts - May 1, 2005

		=======   <<==== 	=== Drier ===	=== Futu	re Co	onditions =	===== Wett	er ====>	·>   	
Forecast Point	Forecast Period	======   90%   (1000AF	70% (1000AF)	1		Exceeding * : )% (% AVG.)	30%   (1000AF	10%	i :	30-Yr Avg. (1000AF)
Lake Powell inflow	APR-JUL	6660	7810	86	00	108	9390	10540		7930
Virgin River nr Virgin	APR-JUL	200	215	2	25	352	l 245	270		64
Virgin River nr Hurricane	APR-JUL	200	225	1 2	40	348	l   255	280		69
Santa Clara River nr Pine Valley	APR-JUL	15.5	17.5	1 19	. 0	346	   21	23		5.5
Coal Creek nr Cedar City	APR-JUL	51	54		56	290	I   58 	62		19.3
E. GARFIELD, KANE, Reservoir Storage (10)	,			     	====	E. GARFIELD Watershed S	, KANE, WASH nowpack Anal	/		
Reservoir	Usable   Capacity  	*** Usa This Year	ble Storage Last Year		Wate	rshed	c	f =		ar as % of  Average
GUNLOCK	10.4	10.4	6.8	4.3	VIRG	IN RIVER		5 5	10	307
LAKE POWELL	24322.0	8569.0	10193.0		PARO	<b>√AN</b>		2 4	19	314

31.6 |

ENTERPRISE TO NEW HARMONY 2

E. GARFIELD, KANE, WASHIN 9

COAL CREEK

115.5 | ESCALANTE RIVER

0

461

282

425

2

183

323

262

294

The average is computed for the 1971-2000 base period.

OUAIL CREEK

UPPER ENTERPRISE

LOWER ENTERPRISE

38.8

10.0

2.6

27.9

1.5

0.7

40.0

10.0

2.6

<sup>\* 90%, 70%, 50%, 30%,</sup> and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

<sup>(1) -</sup> The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.(2) - The value is natural volume - actual volume may be affected by upstream water management.

UTAH			
SURFACE	<b>WATER</b>	SUPPLY	INDEX
<b>Snow Surveys</b>	NRCS	USDA	
<b>Basin or Region</b>	SWSI/%	Percentile	Years with
May, 2005			Similar SWSI
Bear River	-3.8	4%	04,03,93
Ogden River	0.9	61%	95,79,72,73
Weber River	2.2	77%	78,82,74,80
Provo	-0.5	44%	66,67,78,88
West Uintah Basin	2.0	74%	96,86,01,00
East Uintah Basin	2.9	85%	01,95,98,86
Price River	-1.7	29%	03,89,98,62
San Rafael	0.5	56%	00,74,82,98
Moab	0.6	58%	94,97,92,98
<b>Upper Sevier River</b>	3.7	94%	80,73,95,83
Lower Sevier River	3.5	91%	86,95,85,83
Beaver River	3.1	87%	86,69,79,98
Virgin River	3.8	95%	88,98,95,93
Snow Surveys			SWSI Scale: -4 to 4 Percentile: 0 -
245 N Jimmy Doolittle Ro Salt Lake City, UT (801) 524-5213	d		100%

#### What is a Surface Water Supply Index?

The Surface Water Supply Index (SWSI) is a predictive indicator of total surface water availability within a watershed for the spring and summer water use seasons. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer streamflow which are based on current snowpack and other hydrologic variables. SWSI values are scaled from +4.1 (abundant supply) to -4.1 (extremely dry) with a value of zero (0) indicating media water supply as compared to historical analysis. SWSI's are calculated in this fashion to be consistent with other hydroclimatic indicators such as the Palmer Drought Index and the Precipitation index.

Utah Snow Surveys has also chosen to display the SWSI as a PERCENT CHANCE OF NON-EXCEEDANCE. While this is a very cumbersome name, it has the simplest application. It can be best thought of as a simple scale of 1 to 99 with 1 being the drought of record (driest possible conditions) and 99 being the flood of record (wettest possible conditions) and a value of 50 representing average conditions. This rating scale is a percentile rating as well, for example a SWSI of 75% means that this years water supply is greater than 75% of all historical events and that only 25% of the time has it been exceeded. Conversely a SWSI of 10% means that 90% of historical events have been greater than this one and that only 10% have had less total water supply. This scale is far more intuitive for most people and is totally comparable between basins: a SWSI of 50% means the same relative ranking on watershed A as it does on watershed B, which may not be strictly true of the +4 to -4 scale.

For more information on the SWSI go to: <a href="www.ut.nrcs.usda.gov/snow/">www.ut.nrcs.usda.gov/snow/</a> on the water supply page. The entire period of historical record for reservoir storage and streamflow is available.

#### SNOW COURSE DATA

MAY 2005

SNOW COURSE	ELEV.	DATE		WATER CONTENT		
AGUA CANYON SNOTEL ALTA CENTRAL	8900 8800	5/01 4/27	30 106	12.8 45.8	0.0 28.6	
BEAVER DAMS SNOTEL	8000	5/01	0	.0	0.0	4.7
BEAVER DIVIDE SNOTEL		5/01	2	.3	0.0	3.2
BEN LOMOND PK SNOTEL	8000	5/01	103	51.2	22.5	37.1
BEN LOMOND TR SNOTEL		5/01	25	8.9	0.0	6.8
BEVAN'S CABIN	6450	4/26	16	6.2	0.0	5.0
BIG FLAT SNOTEL BIRCH CROSSING	10290 8100	5/01 4/26	102 5	33.6 1.8	18.1 0.5	20.9 1.4
BLACK FLAT-U.M. CK S		5/01	16	6.8	0.0	7.1
BLACK'S FORK GS-EF	9340	4/26	19	7.7	2.7	8.6
BLACK'S FORK JUNCTN		4/26	9	2.8	0.0	6.8
BOX CREEK SNOTEL	9800	5/01	44	17.6	6.7	10.3
BRIAN HEAD	10000	4/26	86	35.4	14.9	20.8
BRIGHTON SNOTEL	8750	5/01	82	35.2	10.5	25.0
BRIGHTON CABIN BROWN DUCK SNOTEL	8700 10600	4/27 5/01	81 84	34.3 36.6	18.5 19.2	23.6 20.1
BRYCE CANYON	8000	5/01	0	0.0	0.0	20.1
BUCK FLAT SNOTEL	9800	5/01	40	16.0	8.0	15.6
BUCK PASTURE	9700	4/26	45	14.9	6.9	16.7
BUCKBOARD FLAT	9000	5/04	46	19.9	2.2	7.0
BUG LAKE SNOTEL	7950	5/01	54	21.5	10.2	
BURT'S-MILLER RANCH		4/26	0	0.0	0.0	1.3
CAMP JACKSON SNOTEL		5/01	46	25.6	0.8	6.4
CASCADE MOUNTAIN SNO CASTLE VALLEY SNOTEL		5/01 5/01	52 60	22.5 27.3	0.7 2.0	- 7.5
CHALK CK #1 SNOTEL	9100	5/01	66	26.3	13.2	
CHALK CK #2 SNOTEL	8200	5/01	35	13.2	4.3	12.0
CHALK CREEK #3	7500	4/26	0	0.0	0.0	1.8
CHEPETA SNOTEL	10300	5/01	62	28.4	10.1	12.1
CLAYTON SPRINGS SNTL		5/01	53	20.8	5.3	-
CLEAR CK RIDG #1 SNT		5/01	51	24.4	6.2	
CLEAR CK RIDG #2 SNT		5/01	17	7.3	0.0	7.9
CORRAL CURRANT CREEK SNOTEL	8200 8000	5/01	0	. 0	0.0	- 2.6
DANIELS-STRAWBERRY S		5/01	25	12.1	0.0	9.5
DILL'S CAMP SNOTEL	9200	5/01	28	11.4	2.9	9.4
DONKEY RESERVOIR SNO	9800	5/01	29	9.4	4.3	4.2
DRY BREAD POND SNTL	8350	5/01	42	17.4	8.3	18.3
DRY FORK SNOTEL	7160	5/01	19	6.9	2.5	7.7
EAST WILLOW CREEK SN		5/01	14	4.7	0.9	3.0
FARMINGTON U. SNOTEL FARMINGTON LOWER SC		5/01 4/26	106 70	49.2 29.8	34.1 23.7	31.8 22.4
FARMINGTON L. SNOTEL		5/01	37	15.4	7.0	-
FARNSWORTH LK SNOTEL	9600	5/01	64	23.9	22.0	21.1
FISH LAKE	8700	4/27	20	7.8	0.0	5.0
FISH LAKE FIVE POINTS LAKE SNO G.B.R.C. HEADQUARTER	10920	5/01	64	29.3	15.1 5.1	17.5
G.B.R.C. HEADQUARTER	8700	4/27	28	10.7	5.1	14.2
G.B.R.C. MEADOWS	10000	4/27 4/26	70	28.2	5.1 22.2 10.7	25.8
GARDEN CITY SUMMIT GARDNER PEAK SNOTEL	7600 8350		46 50	18.2 21.8	10.7 -	14.7 -
GEORGE CREEK	8840	3/01	30	21.0	_	_
	8400	4/29	17	6.3	1.3	
GOOSEBERRY R.S. SNTL	7900		0	.0	0.3	
GUTZ PEAK SNOTEL	6820	5/01	2	. 9	-	-
HARDSCRABBLE SNOTEL			29		0.0	
HARRIS FLAT SNOTEL	7700	5/01	-	7.0	0.0	
HAYDEN FORK SNOTEL	9100		29	9.8	0.0	
HENRY'S FORK HEWINTA SNOTEL	10000 9500	4/26 5/01	31 16	9.9 4.0	5.2 0.7	
HICKERSON PARK SNTL		5/01	8		0.7	5.7
HIDDEN SPRINGS	5500		Ö	2.8 0.0	0.0	-
HOBBLE CREEK SUMMIT			9	3.8	0.0	
HOLE-IN-ROCK SNOTEL			12	1.9	0.2	
HORSE RIDGE SNOTEL				17.0	5.4	
HUNTINGTON-HORSESHOE			67 30	27.6	17.6	
INDIAN CANYON SNOTEL JOHNSON VALLEY	9100 8850		38 14	17.0 4.8	0.1 0.6	7.9 3.8
JONES CORRAL G.S.		3/23	14	4.0	-	3.8
KILFOIL CREEK	7300	4/26	35	13.8	6.9	9.8
	6300		0	0.0	0.0	-

SNOW COURSE	ELEV.	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 71-00
KIMBERLY MINE SNOTEL	9300	5/01	 45	19.5	6.3	
KIMBERLY MINE SNOTEL KING'S CABIN SNOTEL	8730	5/01	25	12.2	0.0	7.6
KLONDIKE NARROWS KOLOB SNOTEL	7400	4/26	34	13.9	0.0	13.3
KOLOB SNOTEL	9250	5/01	116	51.7	8.9	18.2
LAKEFORK #1 SNOTEL		5/01	55	21.3	8.5	11.5
LAKEFORK BASIN SNTL		5/01	75	21.3 25.4	17.8	23.8
		4/26	13	5.6	0.0	1.8
LAMBS CANYON	7400	1/20	21	8.8	1.1	8.7
LASAL MOUNTAIN LOWER		5/04	11	4.4 11.8 16.2 10.5 2.8 .0		
LASAL MOUNTAIN SNTL		5/01	28	11.8	0.0 0.6	8.7
LIGHTNING RIDGE SNTL		5/01	40	16.2	-	-
LILY LAKE SNOTEL		5/01	28	10.5	0.0	11.1
		4/26	7	2.8	0.0	17
LITTLE BEAR LOWER LITTLE BEAR SNOTEL	6550	5/01	'n	0	0.0	3.4
LITTLE GRASSY SNOTEL	6100	5/01	0	0	0.0	.0
LONG FLAT SNOTEL		5/01	-	.0 3.3	0.0	
		5/01	_	3.3	0.0	
LONG VALLEY JCT. SNT	7500	5/01 5/01 5/01	01	.0 36.7	0.0	.0 20.4
LOOKOUT PEAK SNOTEL		3/UI	9.1	0.7		
LOST CREEK RESERVOIR			10	0.0 9.3	0.0	. 0
LOUIS MEADOW SNOTEL		5/01	T8	9.3	0.0	-
MAMMOTH-COTTONWD SNT		5/01	36	16.7 18.9	1.0	16.0 8.1
MERCHANT VALLEY SNTL		5/01	48	18.9	3.8	8.1
MIDDLE CANYON	7000	4/26	15	6.4 69.1	0.9	
MIDWAY VALLEY SNOTEL		5/01	143		21.0	
MILL CREEK MILL-D NORTH SNOTEL	6950	4/28	49	19.0	16.0	
MILL-D NORTH SNOTEL	8960	5/01	-	34.2	10.7	21.7
MILL-D SOUTH FORK MINING FORK SNOTEL	7400	4/27	29	11.4	0.2	12.4
MINING FORK SNOTEL	8000	5/01	50	25.3	11.8	18.3
MINING FORK SNOTEL MONTE CRISTO SNOTEL MOSBY MTN. SNOTEL MT.BALDY R.S. MUD CREEK #2 OAK CREEK PANGUITCH LAKE R.S.	8960	5/01	78	25.3 32.2	19.2	28.3
MOSBY MTN. SNOTEL	9500	5/01	61	22.6	6.3	12.0
MT.BALDY R.S.	9500	4/27	63	24.6	19.9	
MUD CREEK #2	8600	4/27	30	12.5	5.3	
OAK CREEK	7760	4/27	39	14.6	3.6	
PANGUITCH LAKE R.S.	8200	4/26	11	5.1	0.0	-
PARLEY'S CANYON SNTL	7500	5/01	22	8.7	0.0	9.3
PARRISH CREEK SNOTEL		5/01	66	28.0	18.4	
		5/01		12.8	0.0	
PAYSON R.S. SNOTEL				7.7	7.5	
PICKLE KEG SNOTEL	9600	5/01 5/01	34	22.9		
PINE CREEK SNOTEL RED PINE RIDGE SNTL REDDEN MINE LOWER	0000	5/01				
RED PINE KIDGE SNTL	9200	5/01 4/26	34	12.6	1.0	13.0
KEDDEN WINE TOMEK	85UU	4/26			3.2	15.6
REES'S FLAT	7300	4/27	7	3.1	0.0	7.3
ROCK CREEK SNOTEL		5/01	-		0.0	1.4
ROCKY BN-SETTLEMT SN		5/01	70	35.4	17.0	
SEELEY CREEK SNOTEL			48			15.5
SMITH MOREHOUSE SNTL			23	9.1	0.0	
	9700				42.4	
SPIRIT LAKE	10300		52	19.8	11.1	14.7
SQUAW SPRINGS	9300	4/27	20	8.4	0.0	3.7
STEEL CREEK PARK SNO	10100	5/01	56	17.7	15.7	18.6
STILLWATER CAMP	8550	4/26	11	4.2	0.0	6.8
STRAWBERRY DIVIDE SN	8400	5/01	29	12.3	0.0	11.3
SUSC RANCH	8200	4/27	18	9.8	0.0	2.2
TALL POLES	8800	4/26	49	18 8	7.1	10.9
TEMPLE FORK SNOTEL			33	13.0	0.0	_
THAYNES CANYON SNTL		5/01		44.2	14.5	22.5
THISTLE FLAT	8500	- <b>,</b>			-	-
TIMBERLINE	9100				_	_
TIMBERLINE TIMPANOGOS DIVIDE SN		5/01	77	37.7	2.4	
TONY GROVE LK SNOTEL		•	90	45.1	21.0	34.2
TONY GROVE LA SNOTEL TONY GROVE R.S.	6250		90 5	2.0	0.0	34.2
			71	29.8		
TRIAL LAKE	9960		/1	27.0	16.8	25.2
	9960		68	32.4	15.1	26.5
TROUT CREEK SNOTEL	9400 8900	5/01	36	14.6	1.3	7.8
			10	4.0	0.0	5.0
VERNON CREEK SNOTEL		5/01	34	12.4	0.0	4.5
VIPONT	7670					_
WEBSTER FLAT SNOTEL WHITE RIVER #1 SNTL	9200	5/01	54	27.7	0.0	6.8
	8550	5/01	21	9.0	0.0	7.7
WHITE RIVER #1 SNTL			•		0.0	. 5
WHITE RIVER #1 SNTL WHITE RIVER #3	7400	4/27	0	0.0	0.0	
WHITE RIVER #3	7400 9500		63	26.5	10.5	9.5
WHITE RIVER #3						



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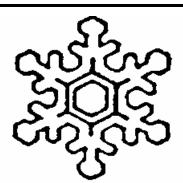
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# Utah Water Supply Outlook Report

Natural Resources Conservation Service Salt Lake City, UT

